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SEAT BELT ARRANGEMENT FOR VEHICLES EQUIPPED WITH SWING SEATS  
[Sicherheitsgurtanordnung für mit Schwingsitzen ausgerüstete Fahrzeuge]

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UNITED STATES PATENT AND TRADEMARK OFFICE  
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CLAIMS

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1. Seat belt arrangement for vehicles, particularly, utility vehicles, that are equipped with swing seats, with a shoulder belt which is assigned to the upper body of the person seated in the vehicle which extends from an attachment or deflection fitting to a reeling device, characterized in that the attachment or deflection fitting (5) is held on the seat frame (2) of the swing seat (1), and that the reeling device is fastened at the height of the shoulder of the passenger on the vehicle's body (10) in such a way that the belt essentially runs into the reeling device vertically in relation to the swing movement of the swing seat.

2. Seat belt arrangement in accordance with Claim 1, characterized in that a run-through fitting (7) guiding the shoulder belt (4) is attached to the seat's backrest (3) of the swing seat (1) at the height of the shoulder of the passenger, and that the reeling device (6) is fastened at the same height as the run-through fitting on the vehicle's body (10) when the seat is occupied.

The invention relates to a seat belt arrangement for vehicles that are equipped with swing seats, particularly, utility vehicles, in accordance with the preamble of Patent Claim 1.

In utility vehicles, drivers' seats are often designed as swing seats, whereby the seating comfort is improved when traveling on rough roadways.

Because the seats carry out vertical oscillations up to 60 mm, the use of conventional automatic seat belts which are fastened to several points on the vehicle's body, which exhibit automatic reeling devices, are

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\*Number in the margin indicates pagination in the foreign text.

uncomfortable and, under some circumstances, totally impossible. This is because the movement of the seat requires a constant change of the belt length that is released by the belt reeling device, whereas the protraction of the belt from the belt reeling occurs only under a certain tensile force which stresses the person seated in the vehicle through unpleasant pressure. On an extremely rough road surface, a blockage of the belt reeling device even results during the movement of the swing seat due to the incidence of extensive accelerations, so that the protraction of the belt is stopped entirely and the person seated in the vehicle is pressed against the unyielding belt due to the movement of the seat.

This problem can be solved by attaching the entire belt to the /3 swinging part of the swing seat. While the attachment of the lap belts on the seat is already known to the art and has also been put into practice in many motor vehicle models, the attachment of the end of the shoulder or upper body belt on the seat's backrest which faces the shoulder can hardly be reasonably realized because of the height of the forces which occur in the case of restraint. The entire backrest and swing fitting design would have to be substantially reenforced, which would imply a substantial construction and cost expenditure.

Therefore, the objective on which the invention is based is the creation of a seat belt arrangement for vehicles that are equipped for swing seats which avoid the above-mentioned disadvantages.

The realization of this objective is carried out in accordance with the characterizing features of Patent Claim 1. Thus, while the attachment

or deflection fitting of the shoulder belt that is assigned to the lap area is attached to the seat frame of the swing seat, the reeling device shall be fastened at the height of the shoulder of the passenger on the vehicle's body; but this should be done in such a way that the belt essentially runs into the reeling device horizontally or, generally stated, vertically, in relation to the swing movement of the swing seat.

This guarantees that, even with large vertical movements of the swing seat, hardly any belt has to be stripped off the reeling device because even then no substantial change occurs in the length of the belt in the horizontal direction. On the one hand, an elaborate backrest design that would be necessary if the reeling device was mounted on the seat's backrest becomes dispensable; on the other hand, a fine comfort in the wearing of the belt itself remains even if the blockage of the reeling device occurs due to a rough road surface.

It is expedient to attach a run-through fitting on the seat's /4  
backrest of the swing seat at the height of the shoulder of the passenger, in order to mount the reeling device at the same height with the run-through fitting on the vehicle's body when the seat is occupied. Because swing seats are, above all, installed in pickup trucks or box cars with partitions, it is also possible to attach the belt reeling device on the side of the vehicle's body behind the backrest of the swing seat, about at the height of the passenger's shoulder. Neither an adjustment of the backrest's inclination nor of the seat position adversely affects the function of the seat belt arrangement in accordance with the invention.

In a schematic representation, the drawings depict a configuration example of the invention which will be explained more closely in the following text. In this context, the swing seat which is mounted in the driver's cab of a utility vehicle on the floor (8) of the vehicle by means of a spring arrangement (9) is marked with (1) which can carry out an essentially horizontal swinging movement in the direction of the arrow (11). The swing seat (1) consists of a seat frame (2) and a seat's backrest (3) which is adjustable in its inclination in relation to it, perhaps via means that are not shown. The seat (1) has been assigned a seat belt which usually consists of a so-called 3-point belt of which only the shoulder belt (4) is suggested in the drawings.

Generally, this shoulder belt extends from the lap area of the passenger who has not been shown so far, diagonally across the chest to the opposite shoulder and is to restrain the upper body of the passenger in the event of danger. Therefore, the belt extends to a reeling device (6) which is provided on the side next to or behind the seat's backrest (3) at shoulder height which starts out from an attachment or deflection fitting (5). This reeling device (6) is mounted at such a height that the seat belt starting out from the shoulder of the passenger and running into the reeling device (6) is essentially horizontal, or, stated more generally, vertical in relation to the swinging movement of the swing seat (1).

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A run-through fitting is marked with (7) which may be attached to the seat's backrest (3) at the height of the shoulder of the passenger and which serves to guide the belt on the seat. Because in this manner,

a change in the length of the belt is hardly necessary, even in the event of more extensive movements of the seat in the vertical direction, because of the essentially horizontal entry of the belt into the reeling device, the wearing comfort of a seat belt is substantially improved for vehicles that are equipped with swing seats. In particular, the pressure on the body of the passengers as a result of the movement of the seat is eliminated.

Even if the reeling device (6) is blocked due to an extremely rough driving distance, perhaps, no extensive stress of the vehicle's passengers is incurred as a result of the belt because hardly any change occurs in the length of the belt with the horizontal movement of the seat. Rather, the belt executes an arched movement in which the belt length remains approximately the same between the stationary reeling device and the run-through fitting (7) which moves up and down horizontally with the seat.

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